

Claims

WHAT IS CLAIMED IS:

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B1
1. ~~Method for inputting information in an information processing device having an input key~~
movable in M directions, said method comprising the acts of:
moving the key in one of the M directions to generate a selection stroke;
repeating said act of moving the key N number of times to generate N selection strokes, a
5 pattern of N selection strokes with each stroke being in one of M directions defining the information
to be input to the information processing device.
 2. The method of claim 1 wherein each act of moving comprises:
providing a selected subset of information from a set of information choices existing prior to the act
of moving.
 3. The method of claim 2 wherein the Nth stroke of the input key provides a final selected subset
of information to be input to the information processing device.
 4. The method of claim 3 wherein the set of information is a set of characters.
 5. The method of claim 4 wherein the information processing device has a display screen to
display the final selected subset of information as a character.
 6. The method of claim 4 wherein the set of characters are alphabetic characters.
 7. The method of claim 4 wherein the set of characters are numeric characters.
 8. The method of claim 2 wherein the information processing device has a display screen to
display each subset of information after each stroke of the input key.

Sub B2
9. ~~A method for interpreting a sequence of input strokes by a multi-directional input key to~~
input an information element into a computing system, said method comprising:

5 drawing a display of the selectable information element set in a pattern illustrating
input key stroke directions for selecting subsets of the selectable information element set with
the input key;

detecting a key stroke direction from movement of the input key;

identifying from the key stroke direction a selected subset of the selectable
information element set;

10 repeating the detecting action and identifying action for a predetermined number of
strokes by the input key so that the identifying step after the last stroke of the input key
identifies a selected information element to be loaded into the computing system.

10. The method of claim 9 further comprises:

loading the selected information element into a user input string for the computing
system.

11. The method of claim 9 wherein the predetermined number of strokes N is given by the
logarithmic value of the number of the information elements in the information element set to a base
M where M is the number of directional strokes available from the input key.

12. The method of claim 11 wherein M equals the number of axes of the input key multiplied by
the number of detectable stroke directions in each axis to define the number of directional
movements available with the input key.

13. The method of claim 12 wherein said detecting action comprises:

detecting a stroke direction by detecting actuation of a switch along an axis of the
input key.

Sub A1
14. ~~The method of claim 9 further comprises:~~

updating the display, after the identifying action, to display the selected subset of the
information element set identified by the identifying action whereby the a user is guided to
the next choices available through the input key.

Sub 83
15. ~~A user interface method in a computing system for inputting a plurality of information elements through a single input device capable of multi-directional strokes, said interface method comprising:~~

entering a directional stroke with the input device to select a subset of information elements to be selected;

repeating said entering step a predetermined number of times until an desired information element is selected and where the predetermined number is identical for each input of a selected information element

16. The method of claim 15 further comprises:

displaying an information element set of selectable elements for input into the computing system to illustrate subsets of information elements selectable with each directional stroke.

17. The interface method of claim 15 further comprises:

updating the subset of information elements displayed by said displaying action based on the directional stroke entered by the entering action.

18. The interface method of claim 16 wherein the displaying action displays the information elements arranged in a pattern to provide guidance as to what subsets of informational elements will be selected by the next directional stroke.

19. The interface method of claim 15 wherein the displaying action displays the information elements arranged in a pattern to provide guidance as to what subsets of informational elements will be selected by the each directional stroke.

Sub B4
20. ~~A computing system for interpreting directional strokes from an input button to enter information into the computing system, said computing system comprising:~~

5 a display processor drawing a display page for a display screen, the display page containing information elements arranged in a pattern to guide selection of information elements by directional strokes of the input button;

 an input adapter detecting directional strokes by the input button;

 a stroke processor identifying an information element for entry in the computing system, the information element identified based on a sequence of directional strokes detected by the adapter, the number of strokes in a sequence being the same for all
10 ~~information elements.~~

21. The computing system of claim 20 wherein the stroke processor comprises:

 information elements array storing the information elements as a hierarchy with a level of the hierarchy associated with each stroke;

5 a select array storing the direction of each stroke at a select level associated with each stroke;

 the stroke processor combining information from the information elements array and the select array to identify a selected information element.

22. The computing system of claim 21 wherein:

 the stroke processor combines information from the information elements array and the select array after each detected stroke to identify a subset of selected information elements; and

5 the display processor displays the subset of selected information after each detected stroke to provide a guide in the selection of information elements or element by the next stroke.

23. The computing system of claim 20 wherein the number of strokes in a sequence to select an information element is given by the expression $N = \log_{(M)} E$ where N is the number of strokes, M is the number of possible directions for each stroke of the input button, and E is the number of information elements in the information element set from which a desired information element is
5 selected.

24. The computing system of claim 23 where the number of information elements E is sixty four graphical or character keys, the number of possible directions for each stroke is four and the number of strokes N in a sequence is 3.

25. The computing system of claim 23 where the number of information elements E is sixteen graphical or character keys, the number of possible directions for each stroke is four and the number of strokes N in a sequence is 2.

- Sub B5
26. ~~A computer readable medium readable by a computer and encoding instructions for executing a computer process for interpreting a sequence of input strokes by a multi-directional input key to input an information element into a computing system, said method comprising:~~
- 5 ~~drawing a display of the selectable information element set in a pattern illustrating~~
- ~~input key stroke directions for selecting subsets of the selectable information element set with the input key;~~
- ~~detecting a key stroke direction from movement of the input key;~~
- ~~identifying from the key stroke direction a selected subset of the selectable~~
- 10 ~~information element set;~~
- ~~repeating the detecting action and identifying action for a predetermined number of~~
- ~~strokes by the input key so that the identifying step after the last stroke of the input key~~
- ~~identifies a selected information element to be loaded into the computing system.~~
27. The computer process in the computer readable medium of claim 26 further comprises:
- loading the selected information element into a user input string for the computing system.
28. The computer process in the computer readable medium of claim 26 wherein the predetermined number of strokes N is given by the logarithmic value of the number of the information elements in the information element set to a base M where M is the number of directional strokes available from the input key.
29. The computer process in the computer readable medium of claim 28 wherein M equals the number of axes of the input key multiplied by the number of detectable stroke directions in each axis to define the number of directional movements available with the input key.
30. The computer process in the computer readable medium of claim 29 wherein said detecting action comprises:
- detecting a stroke direction by detecting actuation of a switch along an axis of the input key.
31. The computer process in the computer readable medium of claim 26 further comprises:
- updating the display, after the identifying action, to display the selected subset of the information element set identified by the identifying action whereby the a user is guided to the next choices available through the input key.

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B6

32. A computer readable medium readable by a computer and encoding instructions for executing a computer process for interpreting directional strokes from an input button to enter information into a computing system, said computer process comprising:

5 drawing a display page for a display screen, the display page containing information elements arranged in a pattern to guide selection of information elements by directional strokes of the input button;

detecting directional strokes by the input button; and

identifying an information element for entry in the computing system, the information element identified based on a sequence of directional strokes detected by the adapter.

33. The computer process in the computer readable medium of claim 32 wherein the identifying action comprises:

storing the information elements in an information elements array as a hierarchy with a level of the hierarchy associated with each stroke;

5 storing the direction of each stroke in a select array at a select level associated with each stroke; and

combining information from the information elements array and the select array to identify a selected information element.

34. The computer process in the computer readable medium of claim 33 wherein:

the combining action combines information from the information elements array and the select array after each detected stroke to identify a subset of selected information elements; and

5 the displaying action displays the subset of selected information after each detected stroke to provide a guide in the selection of information elements or element by the next stroke.

35. The computer process in the computer readable medium of claim 32 wherein the number of strokes in a sequence is the same for all information elements.

36. The computer process in the computer readable medium of claim 35 wherein the number of strokes in a sequence to select an information element is given by the expression $N = \log_{(M)} E$ where N is the number of strokes, M is the number of possible directions for each stroke of the input

button, and E is the number of information elements in the information element set from which a
5 desired information element is selected.

37. The computer process in the computer readable medium of claim 36 where the number of information elements E is sixty four graphical or character keys, the number of possible directions for each stroke is four and the number of strokes N in a sequence is 3.

38. The computer process in the computer readable medium of claim 36 where the number of information elements E is sixteen graphical or character keys, the number of possible directions for each stroke is four and the number of strokes N in a sequence is 2.